

SEQUENCE LISTING

(1) GENERAL INFORMATION:

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(ii) TITLE OF INVENTION: BIOCIDAL PROTEINS

(iii) NUMBER OF SEQUENCES: 59

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(v) COMPUTER READABLE FORM:

(A) MEDIUM TYPE: Floppy disk
(B) COMPUTER: IBM PC compatible
(C) OPERATING SYSTEM: PC-DOS/MS-DOS
(D) SOFTWARE: PatentIn Release #1.0, Version #1.25

(vi) CURRENT APPLICATION DATA:

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(viii) ATTORNEY/AGENT INFORMATION:

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(2) INFORMATION FOR SEQ ID NO:1:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 44 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

Gln Lys Leu Cys Glu Arg Pro Ser Gly Thr Trp Ser Gly Val Cys Gly
1 5 10 15

Asn Asn Asn Ala Cys Lys Asn Gln Cys Ile Asn Leu Glu Lys Ala Arg
20 25 30

His Gly Ser Cys Asn Tyr Val Phe Pro Ala His Lys
35 40

(2) INFORMATION FOR SEQ ID NO:2:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 36 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Gln Lys Leu Cys Gln Arg Pro Ser Gly Thr Trp Ser Gly Val Cys Gly
1 5 10 15

Asn Asn Asn Ala Cys Lys Asn Gln Cys Ile Arg Leu Glu Lys Ala Arg
20 25 30

His Gly Ser Cys
35

(2) INFORMATION FOR SEQ ID NO:3:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 27 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

Gln Lys Leu Cys Glu Arg Pro Ser Gly Thr Trp Ser Gly Val Cys Gly
1 5 10 15

Asn Asn Asn Ala Cys Lys Asn Gln Cys Ile Asn
20 25

(2) INFORMATION FOR SEQ ID NO:4:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 27 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

Gln Lys Leu Cys Glu Arg Pro Ser Gly Thr Xaa Ser Gly Val Cys Gly
1 5 10 15

Asn Asn Asn Ala Cys Lys Asn Gln Cys Ile Arg
20 25

(2) INFORMATION FOR SEQ ID NO:5:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 30 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

Gln Lys Leu Cys Glu Arg Pro Ser Gly Thr Trp Ser Gly Val Cys Gly
1 5 10 15

Asn Asn Asn Ala Cys Lys Asn Gln Cys Ile Asn Leu Glu Lys
20 25 30

(2) INFORMATION FOR SEQ ID NO:6:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 23 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

Gln Lys Leu Cys Glu Arg Pro Ser Gly Thr Trp Ser Gly Val Cys Gly
1 5 10 15

Asn Asn Asn Ala Cys Lys Asn
20

(2) INFORMATION FOR SEQ ID NO:7:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 25 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

Gln Lys Leu Cys Glu Arg Pro Ser Gly Thr Trp Ser Gly Val Cys Gly
5 10 15

Asn Asn Asn Ala Cys Lys Asn Gln Cys
20 25

(2) INFORMATION FOR SEQ ID NO:8:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

Gln Lys Leu Cys Gln Arg Pro Ser Gly Thr Trp Ser Gly Val Cys Gly
1 5 10 15

Asn Asn Asn Ala Cys Arg Asn Gln Cys Ile
20 25

(2) INFORMATION FOR SEQ ID NO:9:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 27 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

Gln Lys Leu Cys Glu Arg Pro Ser Gly Thr Trp Ser Gly Val Cys Gly
1 5 10 15

Asn Ser Asn Ala Cys Lys Asn Gln Cys Ile Asn
20 25

(2) INFORMATION FOR SEQ ID NO:10:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

Glu Leu Cys Glu Lys Ala Ser Lys Thr Trp Ser Gly Asn Cys Gly Asn
1 5 10 15

Thr Gly His Cys Asp Asn Gln Cys Lys Ser Trp Glu Gly Ala Ala His
20 25 30

Gly Ala Cys His Val Arg Asn Gly Lys His Met Cys Phe Cys Tyr Phe
35 40 45

Asn Cys
50

(2) INFORMATION FOR SEQ ID NO:11:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 20 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

Glu Val Cys Glu Lys Ala Ser Lys Thr Trp Ser Gly Asn Cys Gly Asn
1 5 10 15

Thr Gly His Cys
20

(2) INFORMATION FOR SEQ ID NO:12:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 50 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

Glu Leu Cys Glu Lys Ala Ser Lys Thr Trp Ser Gly Asn Cys Gly Asn
1 5 10 15

Thr Lys His Cys Asp Asp Gln Cys Lys Ser Trp Glu Gly Ala Ala His
20 25 30

Gly Ala Cys His Val Arg Asn Gly Lys His Met Cys Phe Cys Tyr Phe
35 40 45

Asn Cys
50

(2) INFORMATION FOR SEQ ID NO:13:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 50 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

Glu Leu Cys Glu Lys Ala Ser Lys Thr Trp Ser Gly Asn Cys Gly Asn
1 5 10 15

Thr Lys His Cys Asp Asn Lys Cys Lys Ser Trp Glu Gly Ala Ala His
 20 25 30

Gly Ala Cys His Val Arg Ser Gly Lys His Met Cys Phe Cys Tyr Phe
35 40 45

Asn Cys
50

(2) INFORMATION FOR SEQ ID NO:14:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 47 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

Lys Thr Cys Glu Asn Leu Ser Gly Thr Phe Lys Gly Pro Cys Ile Pro
 1 5 10 15

Asp Gly Asn Cys Asn Lys His Cys Lys Asn Asn Glu His Leu Leu Ser
20 25 30

Gly Arg Cys Arg Asp Asp Phe Xaa Cys Trp Cys Thr Arg Asn Cys
 35 40 45

(2) INFORMATION FOR SEQ ID NO:15:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 49 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(A) H_2O_2 is a strong oxidant
(B) H_2O_2 is a weak acid
(C) H_2O_2 is a single
(D) H_2O_2 is a diamagnetic

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

Thr Gly His Cys Asp Thr Gln Cys Arg Asn Trp Glu Ser Ala Lys His
20 25 30

Gly Ala Cys His Lys Arg Gly Asn Trp Lys Cys Phe Cys Tyr Phe Asp
 35 40 45

Cys

(2) INFORMATION FOR SEQ ID NO:16:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 4 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

Met Ile Leu Val
1

(2) INFORMATION FOR SEQ ID NO:17:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 4 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

Glu Asp Asn Gln
1

(2) INFORMATION FOR SEQ ID NO:18:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 5 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

Pro Ala Gly Ser Thr
1 5

(2) INFORMATION FOR SEQ ID NO:19:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 51 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

Gln Lys Leu Cys Glu Arg Pro Ser Gly Thr Trp Ser Gly Val Cys Gly
1 5 10 15

Asn Asn Asn Ala Cys Lys Asn Gln Cys Ile Asn Leu Glu Lys Ala Arg
20 25 30

His Gly Ser Cys Asn Tyr Val Phe Pro Ala His Lys Cys Ile Cys Tyr
35 40 45

Phe Pro Cys
50

(2) INFORMATION FOR SEQ ID NO:20:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

Glu Leu Cys Glu Lys Ala Ser Lys Thr Trp Ser Gly Asn Cys Gly Asn
1 5 10 15

Thr Gly His Cys Asp Asn Gln Cys Lys Ser Trp Glu Gly Ala Ala His
20 25 30

Gly Ala Cys His Val Arg Asn Gly Lys His Met Cys Phe Cys Tyr Phe
35 40 45

Asn Cys
50

(2) INFORMATION FOR SEQ ID NO:21: (11) PEGYLATED GLYCOPROTEIN (12) SEQ ID NO:20:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

Glu Leu Cys Glu Lys Ala Ser Lys Thr Trp Ser Gly Asn Cys Gly Asn
1 5 10 15

Thr Lys His Cys Asp Asp Gln Cys Lys Ser Trp Glu Gly Ala Ala His
20 25 30

Gly Ala Cys His Val Arg Asn Gly Lys His Met Cys Phe Cys Tyr Phe
35 40 45

Asn Cys
50

(2) INFORMATION FOR SEQ ID NO:22:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 50 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

Glu Leu Cys Glu Lys Ala Ser Lys Thr Trp Ser Gly Asn Cys Gly Asn
1 5 10 15

Thr Lys His Cys Asp Asn Lys Cys Lys Ser Trp Glu Gly Ala Ala His
20 25 30

Gly Ala Cys His Val Arg Ser Gly Lys His Met Cys Phe Cys Tyr Phe
35 40 45

Asn Cys
50

(2) INFORMATION FOR SEQ ID NO:23:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 47 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

Lys Thr Cys Glu Asn Leu Ser Gly Thr Phe Lys Gly Pro Cys Ile Pro
1 5 10 15

Asp Gly Asn Cys Asn Lys His Cys Lys Asn Asn Glu His Leu Leu Ser
20 (25) 30

Gly Arg Cys Arg Asp Asp Phe Xaa Cys Trp Cys Thr Arg Asn Cys
35 40 45

(2) INFORMATION FOR SEQ ID NO:24:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 49 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

Asn Leu Cys Glu Arg Ala Ser Leu Thr Trp Thr Gly Asn Cys Gly Asn
1 5 10 15
Thr Gly His Cys Asp Thr Gln Cys Arg Asn Trp Glu Ser Ala Lys His
20 25 30
Gly Ala Cys His Lys Arg Gly Asn Trp Lys Cys Phe Cys Tyr Phe Asp
35 40 45
Cys

(2) INFORMATION FOR SEQ ID NO:25:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 45 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

Asn Thr Cys Glu Asn Leu Ala Gly Ser Tyr Lys Gly Val Cys Phe Gly
1 5 10 15
Gly Cys Asp Arg His Cys Arg Thr Gln Glu Gly Ala Ile Ser Gly Arg
20 25 30
Cys Arg Asp Asp Phe Arg Cys Trp Cys Thr Lys Asn Cys
35 40 45

(2) INFORMATION FOR SEQ ID NO:26:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 46 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

Asn Thr Cys Glu His Leu Ala Asp Thr Tyr Arg Gly Val Cys Phe Thr
1 5 10 15
Asn Ala Ser Cys Asp Asp His Cys Lys Asn Lys Ala His Leu Ile Ser
20 25 30
Gly Thr Cys His Asp Trp Lys Cys Phe Cys Thr Gln Asn Cys
35 40 45

(2) INFORMATION FOR SEQ ID NO:27:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 47 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

Lys	Thr	Cys	Glu	Leu	Asn	Ala	Asp	Thr	Tyr	Arg	Gly	Pro	Cys	Phe	Thr
1				5					10						15
Thr	Gly	Ser	Cys	Asp	Asp	His	Cys	Lys	Asn	Lys	Glu	His	Leu	Leu	Ser
	20						25						30		
Gly	Arg	Cys	Arg	Asp	Asp	Val	Arg	Cys	Trp	Cys	Thr	Arg	Asn	Cys	
	35					40					45				

(2) INFORMATION FOR SEQ ID NO:28:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 47 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

Arg	His	Cys	Glu	Ser	Leu	Ser	His	Arg	Phe	Lys	Gly	Pro	Cys	Thr	Arg
1					5			10						15	
Asp	Ser	Asn	Cys	Ala	Ser	Val	Cys	Glu	Thr	Glu	Arg	Phe	Ser	Gly	Gly
	20						25						30		
Asn	Cys	His	Gly	Phe	Arg	Arg	Arg	Cys	Phe	Cys	Thr	Lys	Pro	Cys	
	35					40					45				

(2) INFORMATION FOR SEQ ID NO:29:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 48 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

Arg	Val	Cys	Met	Gly	Lys	Ser	Ala	Gly	Phe	Lys	Gly	Leu	Cys	Met	Arg
1				5				10						15	
Asp	Gln	Asn	Cys	Ala	Gln	Val	Cys	Leu	Gln	Glu	Gly	Trp	Gly	Gly	Gly
	20					25					30				

Asn Cys Asp Gly Val Met Arg Gln Cys Lys Cys Ile Arg Gln Cys Trp
35 40 45

(2) INFORMATION FOR SEQ ID NO:30:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 47 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

Lys Ile Cys Arg Arg Arg Ser Ala Gly Phe Lys Gly Pro Cys Met Ser
1 5 10 15

Asn Lys Asn Cys Ala Gln Val Cys Gln Gln Glu Gly Trp Gly Gly Gly
20 25 30

Asn Cys Asp Gly Pro Phe Arg Arg Cys Lys Cys Ile Arg Gln Cys
35 40 45

(2) INFORMATION FOR SEQ ID NO:31:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 150 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: both
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

GAGCTTGCG AGAAGGCTTC TAAGACTTGG TCTGGAAACT GCGGAAACAC TGGACATTGC 60
GATAACCAAT GCAAGTCTTG GGAGGGAGCT GCTCATGGAG CTTGCCATGT TAGAACCGGA 120
AAGCATATGT GCTTCTGCTA CTTCAACTGC 150

(2) INFORMATION FOR SEQ ID NO:32:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 60 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: both
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

GAGGTTGCG AGAAGGCTTC TAAGACTTGG TCTGGAAACT GCGGAAACAC TGGACATTGC 60

(2) INFORMATION FOR SEQ ID NO:33:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 150 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

GAGCTTGCG AGAAGGCTTC TAAGACTTGG TCTGGAAACT GCGGAAACAC TAAGCATTGC	60
GATGATCAAT GCAAGTCTTG GGAGGGAGCT GCTCATGGAG CTTGCCATGT TAGAACCGGA	120
AAGCATATGT GCTTCTGCTA CTTCAACTGC	150

(2) INFORMATION FOR SEQ ID NO:34:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 150 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

GAGCTTGCG AGAAGGCTTC TAAGACTTGG TCTGGAAACT GCGGAAACAC TAAGCATTGC	60
GATAACAACT GCAAGTCTTG GGAGGGAGCT GCTCATGGAG CTTGCCATGT TAGATCTGGA	120
35 40	150
AAGCATATGT GCTTCTGCTA CTTCAACTGC	

(2) INFORMATION FOR SEQ ID NO:35:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 141 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

AAGACTTGCG AGAACCTTTC TGGAACTTTC AAGGGACCAT GCATTCCAGA TGGAAACTGC	60
AAACAAGCATT GCAAGAACAA CGAGCATCTT CTTTCTGGAA GATGCAGAGA TGATTCNNN	120
TGCTGGTGCA CTAGAAACTG C	141

(2) INFORMATION FOR SEQ ID NO:36:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 147 base pairs

(B) TYPE: nucleic acid
(C) STRANDEDNESS: both
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

AACCTTGCG AGAGAGCTTC TCTTACTTGG ACTGGAAACT GCGGAAACAC TGGACATTGC	60
GATACTCAAT GCAGAAACTG GGAGTCTGCT AAGCATGGAG CTTGCCATAA GAGAGGAAAC	120
TGGAAGTGCT TCTGCTACTT CGATTGC	147

(2) INFORMATION FOR SEQ ID NO:37:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 43 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:37:

Ala Leu Ser Cys Gly Thr Val Asn Ser Asn Leu Ala Ala Cys Ile Gly	
1 5 10 15	
Tyr Leu Thr Gln Asn Ala Pro Leu Ala Arg Gly Cys Cys Thr Gly Val	
20 25 30	
Thr Asn Leu Asn Asn Met Ala Xaa Thr Thr Pro	
35 40	

(2) INFORMATION FOR SEQ ID NO:38:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 43 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:38:

Ala Leu Ser Cys Gly Thr Val Asn Ser Asn Leu Ala Ala Cys Ile Gly	
1 5 10 15	
Tyr Leu Thr Gln Asn Ala Pro Leu Ala Arg Gly Cys Cys Thr Gly Val	
20 25 30	
Thr Asn Leu Asn Asn Met Ala Xaa Thr Thr Pro	
35 40	

(2) INFORMATION FOR SEQ ID NO:39:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 42 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

Gly	Ile	Thr	Cys	Gly	Met	Val	Ser	Ser	Lys	Leu	Ala	Pro	Cys	Ile	Gly
1				5					10					15	
Tyr	Leu	Lys	Gly	Gly	Pro	Leu	Gly	Gly	Ser	Ser	Gly	Gly	Ile	Lys	
	20						25						30		
Ala	Leu	Asn	Ala	Ala	Ala	Ala	Thr	Thr	Pro						
	35						40								

(2) INFORMATION FOR SEQ ID NO:40:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 43 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

Val	Asp	Cys	Gly	Gln	Val	Asn	Ser	Ser	Leu	Ala	Ser	Cys	Ile	Pro	Phe
1				5					10				15		
Leu	Thr	Gly	Gly	Val	Ala	Ser	Pro	Ser	Ala	Ser	Cys	Cys	Ala	Gly	Val
	20				25			25		30					
Gln	Asn	Leu	Lys	Thr	Leu	Ala	Pro	Thr	Ser	Ala					
	35				40										10

(2) INFORMATION FOR SEQ ID NO:41:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 45 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:41:

Val	Leu	Thr	Cys	Gly	Gln	Val	Thr	Gly	Ala	Leu	Ala	Pro	Cys	Leu	Gly
1					5				10				15		
Tyr	Leu	Arg	Ser	Gln	Val	Asn	Val	Pro	Val	Pro	Leu	Thr	Cys	Cys	Asn
	20						25						30		

Val Val Arg Gly Leu Asn Asn Ala Ala Arg Thr Thr Leu
35 40 45

(2) INFORMATION FOR SEQ ID NO:42:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 44 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:42:

Ala Leu Asn Cys Gly Gln Val Asp Ser Lys Asn Lys Pro Cys Leu Thr
1 5 10 15

Tyr Val Gln Gly Gly Pro Gly Gly Pro Ser Gly Leu Cys Cys Asn Gly
20 25 30

Val Arg Asp Leu His Asn Gln Ala Gln Ser Ser Gly
35 40

(2) INFORMATION FOR SEQ ID NO:43:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 44 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:43: (C) STRANDEDNESS: both

Ala Ile Ser Cys Gly Gln Val Ala Ser Ala Ile Ala Pro Cys Ile Ser
1 5 10 15

Tyr Ala Arg Gly Gln Gly Ser Gly Pro Ser Ala Gly Cys Cys Ser Gly
20 25 30

Val Arg Ser Leu Asn Asn Ala Ala Arg Thr Thr Ala
35 40

(2) INFORMATION FOR SEQ ID NO:44:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 26 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: both
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

AAAGAATTCA ARYTNTGYSAR MGNC

(2) INFORMATION FOR SEQ ID NO:45.

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 32 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:45:

AAAGAATTCTTGNGCNGGRAANACRTARTT RC

32

(2) INFORMATION FOR SEQ ID NO:46:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 29 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:46:

AAAGAATTCTGNGACNTGGWSNGGNGTNTG

29

(2) INFORMATION FOR SEQ ID NO:47:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 9 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:47:

AAAGAATTC

9

(2) INFORMATION FOR SEQ ID NO:48:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 414 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- (A) NAME/KEY: CDS
- (B) LOCATION: 16..255

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:48:

GTTCATTTAG TGATC ATG GCT AAG TTT GCG TCC ATC ATC GCA CTT CTT TTT Met Ala Lys Phe Ala Ser Ile Ile Ala Leu Leu Phe 1 5 10	51
GCT GCT CTT GTT CTT TTT GCT GCT TTC GAA GCA CCA ACA ATG GTG GAA Ala Ala Leu Val Leu Phe Ala Ala Phe Glu Ala Pro Thr Met Val Glu 15 20 25	99
GCA CAG AAG TTG TGC GAA AGG CCA AGT GGG ACA TGG TCA GGA GTC TGT Ala Gln Lys Leu Cys Glu Arg Pro Ser Gly Thr Trp Ser Gly Val Cys 30 35 40	147
GGA AAC AAT AAC GCA TGC AAG AAT CAG TGC ATT AAC CTT GAG AAA GCA Gly Asn Asn Asn Ala Cys Lys Asn Gln Cys Ile Asn Leu Glu Lys Ala 45 50 55 60	195
CGA CAT GGA TCT TGC AAC TAT GTC TTC CCA GCT CAC AAG TGT ATC TGC Arg His Gly Ser Cys Asn Tyr Val Phe Pro Ala His Lys Cys Ile Cys 65 70 75	243
TAC TTT CCT TGT TAATTTATCG CAAACTCTTT GGTGAATAGT TTTTATGTAA Tyr Phe Pro Cys 80	295
TTTACACAAA ATAAGTCAGT GTCACTATCC ATGAGTGATT TTAAGACATG TACCAAGATAT	355
GTTATGTTGG TTCGGTTATA CAAATAAAAGT TTTATTCAACC AAAAAAAA AAAAAAAA	414

(2) INFORMATION FOR SEQ ID NO:49:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 80 amino acids
- (B) TYPE: amino acid
- (C) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:49: ~~SEQUENCE DESCRIPTION: SEQ ID NO:51:~~

Met Ala Lys Phe Ala Ser Ile Ile Ala Leu Leu Phe Ala Ala Leu Val 1 5 10 15
Leu Phe Ala Ala Phe Glu Ala Pro Thr Met Val Glu Ala Gln Lys Leu 20 25 30
Cys Glu Arg Pro Ser Gly Thr Trp Ser Gly Val Cys Gly Asn Asn Asn 35 40 45
Ala Cys Lys Asn Gln Cys Ile Asn Leu Glu Lys Ala Arg His Gly Ser 50 55 60
Cys Asn Tyr Val Phe Pro Ala His Lys Cys Ile Cys Tyr Phe Pro Cys 65 70 75 80

(2) INFORMATION FOR SEQ ID NO:50:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 284 base pairs
- (B) TYPE: nucleic acid

(C) STRANDEDNESS: both
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

(A) NAME/KEY: CDS
(B) LOCATION: 1..108

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:50:

GGA AAT AAT AAC GCA TGC AAG AAT CAG TGC ATT CGA CTT GAG AAA GCA Gly Asn Asn Asn Ala Cys Lys Asn Gln Cys Ile Arg Leu Glu Lys Ala	48
1 5 10 15	
CGA CAT GGG TCT TGC AAC TAT GTC TTC CCA GCT CAC AAG TGT ATC TGT Arg His Gly Ser Cys Asn Tyr Val Phe Pro Ala His Lys Cys Ile Cys	96
20 25 30	
TAT TTC CCT TGT TAATTCCATA AACTCTTCGG TGGTTAATAG TGTGCGCATA Tyr Phe Pro Cys	148
35	
TTACATATAA TTAATAAGTT TGTGTCACTA TTTATTAGTG ACTTTATGAC ATGTGCCAGG	208
TATGTTATG TTGGGTTGGT TGTAATATAA AAAAGTTCAC GGATAATAAG ATGATAAGCT	268
CACGTGCCA AAAAAA	284

(2) INFORMATION FOR SEQ ID NO:51:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 36 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

Gly Asn Asn Asn Ala Cys Lys Asn Gln Cys Ile Arg Leu Glu Lys Ala 1 5 10 15	
Arg His Gly Ser Cys Asn Tyr Val Phe Pro Ala His Lys Cys Ile Cys	30
20 25	
Tyr Phe Pro Cys 35	

(2) INFORMATION FOR SEQ ID NO:52:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 36 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: both
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:52:

ATAGAATTCTG ACGTGAGCTT ATCATCTTAT TATCCG

36

(2) INFORMATION FOR SEQ ID NO:53:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 21 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:53:

CTTGGCCTTT GGCACAACTT C

21

(2) INFORMATION FOR SEQ ID NO:54:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 21 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:54:

GCTTTCTCAA GTCTAATGCA C

21

(2) INFORMATION FOR SEQ ID NO:55:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 41 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:55:

AACTCGAGCT GCAGTGTGCA CCTATTAACA AGGAAAGTAG C

41

(2) INFORMATION FOR SEQ ID NO:56:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 40 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:56:

GGAATAGCCG ATCGAGATCT AGGAAACAGC TATGACCATG

40

(2) INFORMATION FOR SEQ ID NO:57:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 24 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:57:

GGAATAGCCG ATCGAGATCT AGGA

24

(2) INFORMATION FOR SEQ ID NO:58:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 288 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- (A) NAME/KEY: CDS
- (B) LOCATION: 43..282

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:58:

CCCCGGGCTG CAGGAATTCT CGGCCGCGTT TTATTAGTGA TC ATG GCT AAG TTT
Met Ala Lys Phe
1

54

GCG TCC ATC ATC GCA CTT CTT TTT GCT GCT CTT GTT CTT TTT GCT GCT
Ala Ser Ile Ala Leu Leu Phe Ala Ala Leu Val Leu Phe Ala Ala
5 10 15 20

102

TTC GAA GCA CCA ACA ATG GTG GAA GCA CAG AAG TTG TGC CAA AGG CCA
Phe Glu Ala Pro Thr Met Val Glu Ala Gln Lys Leu Cys Gln Arg Pro
25 30 35

150

AGT GGG ACA TGG TCA GGA GTC TGT GGA AAC AAT AAC GCA TGC AAG AAT
Ser Gly Thr Trp Ser Gly Val Cys Gly Asn Asn Ala Cys Lys Asn
40 45 50

198

CAG TGC ATT AGA CTT GAG AAA GCA CGA CAT GGA TCT TGC AAC TAT GTC
Gln Cys Ile Arg Leu Glu Lys Ala Arg His Gly Ser Cys Asn Tyr Val
55 60 65

246

TTC CCA GCT CAC AAG TGT ATC TGC TAC TTT CCT TGT TAATAG
Phe Pro Ala His Lys Cys Ile Cys Tyr Phe Pro Cys
70 75 80

288

(2) INFORMATION FOR SEQ ID NO:59:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 80 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:59:

Met Ala Lys Phe Ala Ser Ile Ile Ala Leu Leu Phe Ala Ala Leu Val
1 5 10 15

Leu Phe Ala Ala Phe Glu Ala Pro Thr Met Val Glu Ala Gln Lys Leu
20 25 30

Cys Gln Arg Pro Ser Gly Thr Trp Ser Gly Val Cys Gly Asn Asn Asn
35 40 45

Ala Cys Lys Asn Gln Cys Ile Arg Leu Glu Lys Ala Arg His Gly Ser
50 55 60

Cys Asn Tyr Val Phe Pro Ala His Lys Cys Ile Cys Tyr Phe Pro Cys
65 70 75 80